# Helping Mothers Survive: Implementing the Bleeding After Birth Program at the John F. Kennedy Medical Center in Monrovia, Liberia

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## Abstract

While significant throughout Sub-Saharan Africa, the West African country of Liberia suffers from one of the highest maternal mortality rates in the world. Here, the lifetime risk of a woman dying as a result of pregnancy or childbirth complications is 1 in 24. Although pregnancy-related hypertension conditions, anemia, infection, and unsafe abortion all attribute significantly to maternal death, postpartum hemorrhage – heavy, life-threatening bleeding after childbirth – is the leading cause of maternal mortality globally. Research suggests that active management of the third stage of labor (AMTSL), a practice that shortens the length of time from the delivery of the baby to the delivery of the placenta through the use of medications and manual interventions on the part of the provider, can significantly reduce the incidence of postpartum hemorrhage where necessary resources are available and where health workers receive training in using AMTSL.

The Helping Mothers Survive – Bleeding after Birth (HMS-BAB) program is a didactic and simulator-based training package for frontline maternity providers to equip them with the knowledge and skills needed to prevent mothers from dying on the day of birth. The program is centered on the evidence-based practice of AMTSL for hemorrhage prevention, as well as the necessary steps to engage should a postpartum hemorrhage occur. Recent research suggests the HMS-BAB program significantly improves a provider's knowledge, skill, and confidence in managing postpartum hemorrhage, both initially as well as over time.

The following describes the implementation process to bring the HMS-BAB Program to the John F Kennedy Medical Center in Monrovia, Liberia's. This tertiary-care medical campus

includes a 139-bed women and infant hospital and neonatal intensive care unit where Certified Midwives attend the vast majority of vaginal deliveries. The HMS-BAB program was introduced there in January, 2016, and successfully trained over 92% of the midwives working in the maternity hospital. While knowledge and skill gaps related to AMTSL practice were identified, midwives who completed the program reported improved self-efficacy and intent to incorporate AMTSL techniques into their practice. A clinical guideline was created and given to the administrators, nurses, and physicians of the maternity hospital to reinforce and sustain this change in practice.

# Helping Mothers Survive: Implementing the Bleeding After Birth Program at the John F. Kennedy Medical Center in Monrovia, Liberia

## Introduction

### Problem description.

In September, 2015, the United Nations (UN) launched a global development agenda as the 15 year time frame for the previously established Millennium Development Goals (United Nations Development Programme, 2013) came to a close. This new 2030 Agenda for Sustainable Development (United Nations, 2015a) aims to "end poverty, protect the planet, and ensure prosperity for all" through achievement of 17 Sustainable Development Goals (SDGs) between 2016 and 2030. With efforts to improve overall maternal health, the first target of the 3rd SDG, Good Health and Wellbeing, aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 (United Nations, 2015b).

While maternal mortality rates around the globe have improved since the early 1990's, there is still room for progress. According to the United Nations (2013), the most dangerous place in the world to have a baby in 2010 was Sub-Saharan Africa, where 885 women died per 100,000 live births on average for the region. Several social, economic, political, and bio-medical factors contribute these staggering numbers, and conditions often culminate to disastrous ends. Although preeclampsia, anemia, infection, and unsafe abortion all attribute significantly to maternal death, postpartum hemorrhage (PPH) is the leading cause of maternal mortality globally, and accounts for approximately 25% of maternal deaths worldwide (WHO, 2012). In

Sub-Saharan Africa, this number can reach as high as 30-39% in some countries (Sanghvi & Lewison, 2006).

Uterine atony is the most prevalent cause of postpartum bleeding in the world and occurs when the uterus fails to contract adequately following delivery, allowing up to 800mL/min of blood to hemorrhage from the placental bed (Breathnach & Geary, 2008). Without the presence of trained birth attendants who have the knowledge and skill set to intervene appropriately should hemorrhage arise, women can quickly loose a life-threatening amount of blood in a very short period of time following delivery. Several risk factors for PPH have been identified, however, as many as two thirds of women who hemorrhage after childbirth have no identifiable risk factors (JHPIEGO, 2012). Because of the unpredictability of PPH and uterine atony, experts suggest adherence to strict practice protocols in order to manage the immediate postpartum period, minimize blood loss, and prevent life-threatening hemorrhage.

Research suggests active management of the third stage of labor (AMTSL) can reduce the incidence of PPH by up to 60% where necessary resources are available, where clinical guidelines support the use of AMTSL, and where health workers are trained in the use of the technique (JHPIEGO, 2012). The current definition of AMTSL involves three components performed during the third stage of labor to expedite delivery of the placenta and minimize uterine atony by promoting contractions of the uterus: 1) administration of a uterotonic agent immediately following the delivery of the newborn to promote uterine contractions, 2) controlled umbilical cord traction to facilitate expulsion of the placenta, and 3) uterine massage after delivery of the placenta to encourage further contraction of the uterine muscle (ICM-FIGO, 2006; WHO, 2012). Because of its potential impact on the rate and severity of PPH, AMTSL is recommended for use by the WHO (2012), the Maternal and Child Health Integrated Program

(MCHIP) of the USAID (JHPIEGO, 2012), the International Federation of Gynecology and Obstetrics (FIGO), and the International Confederation of Midwives (ICM) (FIGO-ICM, 2006). In addition, AMTSL is included in basic skills training recommended by the ICM as a standard competency in global midwifery education (ICM, 2012).

The West African country of Liberia suffers from one of the highest maternal mortality rates in the world at an adjusted rate of 770 deaths per 100,000 live births (UNICEF, 2013). Here, the lifetime risk of maternal death as of 2010 was one in 24 women. Liberia's capitol city of Monrovia has the country's only tertiary care hospital, the John F. Kennedy Medical Center (JFKMC). Located in the heart of Monrovia, the JFKMC campus comprises of four separate patient care and educational centers, including the Liberian-Japanese Friendship Maternity Hospital, a 139-bed women and infant hospital with a neonatal intensive care unit (W. Scott-McDonald, personal communication, January 14, 2014), and the Tubman National Institute of Medical Arts (TNIMA), which houses the JFKMC-associated nursing and midwifery educational programs. While the institution faces several challenges with regards to accuracy in statistical record keeping, the rate of PPH for the Maternity Hospital in 2014 was calculated at 19% (C. Jones, personal communication, January 28, 2016). Vaginal deliveries at the JFKMC are attended by Certified Midwives (CMs) who staff the obstetrical triage, labor and delivery, and immediate postpartum units. Registered Nurses (RNs) are also employed by the hospital to provide nursing care for mothers and their newborns on all patient wards. Unpublished data collected by this author during a skills assessment piolet project conducted over three days in September, 2013 with the Maternity Hospital CMs suggested limited, inconsistent knowledge and practice of AMSTL within the institution. While other factors such as the access to necessary medical supplies and staffing concerns were proposed after this piolet study as further impacting

the issue of PPH at JFKMC, knowledge deficits and a lack of a routine AMTSL practice by CMs are assumed to be the primary cause of PPH rates within the institution.

**Available knowledge.**

Research supports the use of educational interventions for birth providers on the proper application and practice of AMTSL as a means to reduce the incidence of postpartum hemorrhage. In their longitudinal study at the Tibetan Delek Hospital in North India between 1996 and 2003, Mercer, Sevar, & Sadustshan (2006) found a 50% reduction in the rates of PPH following an AMTSL training intervention implemented with hospital physicians, midwives, and obstetrical nurses, with a sustained reduction of 50% of the baseline hemorrhage rates at seven years after the educational intervention. Similarly, Sorensen, Rasch, Massawe, Nyakina, Elsass, & Nielsen (2011) explored the impact of AMTSL education among physicians, medical officers, and nurse midwives at the Kageria Regional Hospital in Tanzania. After provider training, the incidence of PPH (defined as >500mL of blood loss) fell from 32.9% at baseline to 18.2% at seven weeks after the intervention, and severe PPH (defined as >1000mL of blood loss) fell from 9.2% initially to 4.3% at the end of the study.

In addition to a reduction in the incidence of PPH, other research has found that AMTSL training itself has a significant impact on the healthcare provider's compliance and consistent practice of the technique. As part of an ongoing collaboration, Low, Bailey, Sacks, Robles, & Medina (2012) conducted a prospective investigation involving a PPH prevention training for nurses providing maternity care at the Clinica Materno-Infantil (CMI) birth center in rural northern Honduras. Specifically, the intervention involved training nurses in AMTSL practice, including the administration of an intramuscular uterotonic agent, as well as accurate estimations of postpartum blood loss. After nurses received training on AMTSL, the use of the utertonic

medication during the third stage of labor increased from 63.8% to 96.5% during the twelve month time frame of the study. PPH rates decreased significantly from 14.8% to 5.9% during this time as well.

In another study, Chandhiok, Dhillon, Datey, Mathur, & Saxena (2006) explored the impact of provider training on the practice of AMTSL amongst paramedical workers in five geographically diverse states in India. In this study, participants received a five-day skills-based, hands-on training around the components of AMTSL. Because the prevalence of PPH in this study was much lower than anticipated (<1%), the authors concluded that the study was not able to address PPH reduction by AMTSL implementation. However, analysis did find that the paramedical workers who received the training followed the steps of AMTSL in 99% of the deliveries observed.

Finally, clinical guidelines supporting AMTSL can positively influence the practice of active management in childbirth and improve the overall rates of PPH. Figueras, Narvaez, Vasquez, Rojas, Camilo, de Valle, and Aguilera (2008) conducted a longitudinal, multi-country study in which physicians, residents, midwives, and obstetrical nurses in seven teaching hospitals throughout Nicaragua, Peru, Dominican Republic, and Argentina participated in workshops held at each institutional location involving both the theoretical content detailing the evidence supporting AMTSL, as well the development, dissemination, and utilization of clinical practice guidelines advising AMTSL for PPH prevention. Retrospective chart audits of deliveries at the seven institutions found the documentation of all aspects of AMTSL increased significantly from baseline (26.3%) at both three (72.6%) and twelve (58.7%) months following the intervention. Rates of PPH fell over the time frame of the study as well, from 12.7% at baseline to 6.9% at three months to 5.0% at one year.

One specific curriculum that has been successfully employed to address the concern of PPH and maternal mortality is the Helping Mothers Survive Bleeding after Birth (HMS-BAB) Program (JHPIEGO, 2016a). Developed by the Johns Hopkins University-affiliated organization JHPIEGO, in conjunction with the non-profit medical product company Laerdal Global Health, the competency-based HMS-BAB program was introduced in 2013. This single-day training emphasizes didactic and scenario simulations related to the prevention, detection, and management of PPH based on the three components of AMTSL (JHPIEGO, 2016b). One particular feature of the HMS-BAB curriculum is the recommendation that concise but frequent follow-up simulation drills be performed in the subsequent weeks and months following the initial workshops to reinforce new knowledge and skill acquisition amongst trainees.

Evans, Johnson, Bazant, Bhatngar, Zgambo, & Khamis (2014) initially validated the HMS-BAB program in a 2012 study involving 155 skilled and semiskilled birth attendants participating in training in India, Malawi, and Zanzibar, Tanzania. The investigation involving a pre- and post-assessment of participants to assess knowledge, confidence, skills, and program acceptability. Analysis showed that the HMS-BAB training increased knowledge and confidence among all cadres in all three countries. After workshop participation, over 90% of participants passed the knowledge exam, and 83-89% passed the skills assessment on AMTSL, retained placenta, and severe PPH management. The overall self-reported confidence scores also increased significantly from before to after training among all cadres in all countries, especially in the management of severe PPH. Researchers also found the acceptability of training materials and methods to be high among all training participants, especially with regards to the one-day time frame allotted for training, the experience with the program instructors, and the use of the simulator as a teaching tool.

To assess retention of program skills, knowledge, and confidence over time, Nelissen, Ersdal, Mduma, Evjen-Olsen, Broerse. Van Roosmalen, & Stekelenburg (2015) evaluated 38 obstetrical healthcare workers at a rural hospital in Northern Tanzania before, immediately after and nine months following HMS-BAB training. While didactic knowledge scores saw a significant initial increase (70% to 77%), these were found to have decreased to near pre-training levels (72%) by the nine-month follow-up point. Skills and confidence scores, however, were found to be largely maintained. The mean score in basic childbirth delivery skills rose from 43% to 51% after the initial training, and was 49% at nine months. Similarly, mean scores of PPH management increased with the educational intervention and were maintained over time (39% to 51% after training; 50% at nine months), and self-reports of participant confidence increased immediately after training and were largely maintained at the nine-month follow-up. While their results suggest even a one-time HMS-BAB teaching intervention can impact the skills and confidence necessary to manage PPH complications, the authors do suggest that some degree of continued simulator training is required for long-term knowledge retention of AMTSL and PPH management (Nelissen, Ersdal, Mduma, Evjen-Olsen, Broerse. Van Roosmalen, & Stekelenburg, 2015).

**Rationale.**

The theoretical approach used to underpin this implementation project is the Theory of Planned Behavior (TPB), which is built upon a preceding theory called the Theory of Reasoned Action (TRA) (Armitage & Connor, 2001). TRA and TPB were founded on the premise that many of the behaviors an individual performs can be predicted simply from a person's intentions to perform those behaviors – which is to say that people generally do what they intend to do.

These intents are thus termed “behavioral intentions”, and are generally good predictors of an individual’s future behavior (Fishbein & Ajzen, 1975).

Through an Intervention Mapping (IM) process (Tortolero, Markham, Parcel, Peters, Escobar-Chaves, Basen-Engquist, & Lewis, 2005), health behavior determinants and performance objectives of the HMS-BAB educational intervention were linked with specific theoretical underpinnings, methods, and strategies. Behavioral intentions are influenced by factors such as self-efficacy, the expected value of the action, and subjective norms, in addition to the knowledge and skill that an individual has around a particular topic. Behavior determinants are linked with specific performance objectives of AMTSL and PPH identification and management. By framing the HMS-BAB intervention in this theoretical model, the constructs of the TPB also informed the evaluation process for this project.

The TPR has been used in a number of studies to predict health professionals’ behavior with respect to the uptake of specific research evidence (Perkins et al., 2007; Eccles et al., 2007). TPR’s theoretical constructs of attitudes, subjective norms, and behavioral control offer value in implementing the HMS-BAB program to influence AMTSL and PPH prevention and management in the current project, and are especially applicable in this intervention. If the midwives at JFKMC adopt a positive attitude towards AMTSL and effective PPH management, develop the perception and confidence that they are able to engage in the activities of providing the requisite AMTSL and hemorrhage intervention, and perceive that the beliefs and opinions of others, especially that of their peers and superiors, support both AMTSL and the educational intervention around PPH prevention and management, the HMS-BAB educational intervention is more likely to create a successful change in behavior.

**Specific aims.**

The HMS-BAB Program was implemented at the JFKMC Maternity Hospital in order to improve CM knowledge and clinical performance of AMTSL techniques to prevent PPH, as well as recognize and manage hemorrhage. The HMS-BAB printed material and Mama Natalie birth simulator (Laerdal Global Health, 2015) utilized in the program were provided by this author and then left with the Nurse Educator of the Maternity Hospital. A full orientation to both printed material and the Mama Natalie simulator was provided to the Nurse Educator in order to conduct future drills for knowledge and skill reinforcement, as well as to train new staff in the HMS-BAB approach to AMTSL and PPH management.

The anticipated result of this implementation project was improved clinical performance and use of AMTSL and PPH management interventions as a means to reduce JFKMC's rates of PPH. In turn, this will positively impact the maternal morbidity and mortality associated with excessive blood loss after childbirth. Specific to this goal, the project included the following objectives for staff midwives:

1. Demonstrate consistent and correct practice of AMTSL as presented in the HMS-BAB curriculum for postpartum hemorrhage prevention.
2. Demonstrate understanding of a normal vs. abnormal third stage of labor.
3. Demonstrate proper management of an abnormal third stage of labor and postpartum hemorrhage.

A second intention of this implementation endeavor involved working with the unit midwives, Maternity Hospital physicians, and JFKMC nursing leadership to then create a clinical practice guideline for the CMs and nursing staff around AMTSL practice and PPH management. This resource is to remain available for ongoing staff reference and new employee orientation to

further promote and encourage accurate and consistent performance of AMTSL during all deliveries at JFKMC. Connecting with the attending and resident OB/GYN physicians at the Maternity Hospital, making them aware of the educational material and project goals, and including them in the development of the practice guideline helped to promote interprofessional collaboration, respect, and transparency. Efforts to change CM clinical practice and improve care for the maternity patients are assumed to be optimized with physician endorsement and support of this project.

## Methods

### Context.

The decision was made to implement the HMS-BAB Program over other AMTSL educational courses for a number of reasons. First, HMS-BAB provides a detailed and comprehensive program (Jhpeigo, 2016a) that has been validated in resource-poor settings (Evans, Johnson, Bazant, Bhatnagar, Sgambo, & Khamis, 2014). Second, HMS-BAB is an extension and compliment of the Helping Babies Breathe (HBB) program (American Academy of Pediatrics, 2016), which was previously implemented at JFKMC by the current Administrator of the Maternity Hospital in her prior role as the Clinical Nurse Educator. Both program are structured similarly with regards to a simple, small-group workshop format, and the use of brief, recurring drill sessions for content reinforcement and sustained health worker performance once the initial training is complete. The decision was made to implement the HMS-BAB Program partly because of its connection to the HHB material, assuming the staff, Maternity Hospital Administrator, and current Clinical Nurse Educator would have some degree of familiarity with the methodology used in the course. Third, the literature suggests that when conducted in close proximity to the work site, low-dose, high-frequency simulation practice inherent to the HMS-

BAB Program has been associated with greater skills retention, knowledge transfer, and changes in performance (Coomarasamy & Khan, 2004; Sturm, Windsor, Cosman, Cregan, Hewett, & Maddern, 2008; Harder, 2010). Lastly, the format for HMS-BAB training involves a one-day, small group session for clinicians versus the multi-day time frame other AMTSL courses. The shorter one-day training had the benefit of not removing staff from their clinical work for extended periods of time, and would also be easier to coordinate from a logistical perspective so that all CMs at JFKMC can attend given the time frame project execution.

**Implementation.**

The HMS-BAB program instruction and simulation was conducted for the Maternity Hospital staff between Monday, January, 25th and Monday, February 1st, 2016 by this author: A Certified Nurse-Midwife with eight years of professional experience in midwifery, including over two years spent in a resource-poor, international setting. In order to maximize efforts and program success, one week of pre-implementation time was budgeted at JFKMC in order to connect with midwifery and nursing staff, physicians, hospital administrators and nursing leaders, and the TNIMA faculty where the educational workshops were conducted. Relationship building is essential for program implementation and ultimate success, and this pre-intervention time afforded the opportunity to observe the current clinical practice of CMs, as well as reestablish in-person relationships with prior contacts.

After an initial meeting with the Maternity Hospital Administrator and the Nurse Managers of the various patient care units, a schedule for the course workshops was established. Nurse Managers then worked with unit staff to ensure patient care coverage in order to maximize employee participation throughout the training week. The HMS-BAB program is specifically aimed at childbirth providers and as such, CMs were prioritized during workshop scheduling.

Nursing leadership felt that RNs should also be included in the educational training, so unit managers attempted to schedule all Maternity Hospital staff for one workshop session as well.

Thirty-nine CMs and 31 RNs were employed by the Maternity Hospital at the time this project was implemented. Staff participation in the training was ultimately voluntary, as CMs and RNs were not financially compensated for participation in the HMS-BAB workshops. In order to maximize CM and RN involvement with the training while meeting the staffing demands of the hospital, the decision was made by nursing leadership and this author to provide half-day, four hour trainings sessions instead of the more standard single-day workshops which are more prevalent in this curriculum. The HMS-BAB Program recommends a classroom size of no more than 6-8 trainees per trainer. Given the 70 staff members who were to participate in the training, eight, four-hour sessions were scheduled. Upon completion of the training, participants were given a certificate of attendance which could then be used towards continuing education credit though JFKMC's nursing department.

Facilitation of the HMS-BAB workshops were conducted per the Program Implementation Guide provided free of cost thought JHPEIGO (2016b). Prior to conducting the various workshops, this author thoroughly familiarized herself with the HMS-BAB Program and implementation material, as well as completed over 30 hours of additional video modules produced by JHPEIGO to acquaint trainers with learning activities such as case studies, role play, clinical simulation, and final training assessment. Materials for the HMS-BAB program included a graphic flipbook for didactic material, poster reference aids that were later left in the clinical care areas to support clinical decision making after the training, and participant handbooks for further learning and later reference. The economical, apron-style Mama Natalie simulator available from Laerdal Global Health (2016) was also used for the simulation portion

of the program. This simulator design consisted of an abdominal “skin” containing a uterus which holds a fetal mannequin, a postpartum sized uterus, and a fluid tank used to simulate normal bleeding and postpartum hemorrhage. As mentioned previously, all of this educational material was left at the JFKMC at the conclusion of the project.

The didactic material involved lecture content presenting normal childbirth, the three steps of AMTSL for PPH prevention, various causes of postpartum bleeding, normal versus abnormal third stage of labor, and management of abnormal conditions, including retained placenta, further uterotonic administration, vaginal lacerations, and massive hemorrhage necessitating bimanual compression and emergency transfer. Throughout the program, themes of preparation and critical thinking were emphasized. Interspersed in the didactic content were simulation sessions utilizing Mama Natalie to practice the previously reviewed content per the HMS-BAB structure. In total, three lecture-simulation cycles were facilitated in each workshop for each trainee, with additional time spent on confusing or unclear content as needed. Prior to each training session, a Pre-Program Knowledge Quiz was given to each participant and at the conclusion of the workshop, participants completed a final Course Evaluation. In addition, this author completed a Skills Checklist for each staff member during the three cycles of simulation. All quizzes, checklists, and evaluations were kept anonymous, outside of a delineation between CM and RN responses in order to facilitate later analysis and meaningful conclusions. Each of these will be discussed in more detail below.

Upon completion of the workshops, this author then drafted a clinical practice guideline for midwifery and nursing staff around the AMTSL techniques and PPH management recommendations specified in the HMS-BAB material. This document was then distributed to the nursing leaders and OB/GYN physicians for feedback. Nursing comments were

overwhelmingly positive and offered no constructive remarks. Physician feedback was not received until after this author returned to the United States in February, 2016. Much of the physician comments addressed advanced surgical and critical care management of the patient with massive PPH and as such, was not applicable to a nursing/midwifery protocol, this feedback was incorporated into the document as appropriate, and a final draft was given to the Maternity Hospital Administrator.

**Evaluation and analysis.**

As mentioned above, because the IM method and TBP constructs were used to frame this project intervention, both the mapping process and behavioral theory also informed the evaluation approach utilized in this work. The assessment tools employed included a 14 question Pre-Program Knowledge Check (Appendix A) to evaluate didactic knowledge and clinical skills around AMTSL, a 21 item Skills Checklist (Appendix B) for simulation performance based on the HMS-BAB competencies, and a post-training Course Evaluation (Appendix C) with 25 Likert-type questions and three write-in opportunities to explore the concepts of attitudes and beliefs, self-efficacy, social norms, and institutional support around and for the techniques presented in the HMS-BAB Program. This summative evaluation also solicited feedback regarding organization of the course as well as the overall assessment and experience of the learner.

In its comprehensive development of the HMS-BAB Program, JHPEIGO developed evaluation tools to be used with this module, including a Pre-Training Knowledge Assessment, and Skills Checklists. These resources were used in the project implementation largely unmodified. The Course Evaluation was penned by this author to reflect the implementation and

theoretical models developed in previous academic coursework. As such, the final Course Evaluation utilized for this series of workshops has not been validated in other studies.

Analysis of this implementation project involved descriptive statistics detailing the performance scores on the Pre-Program Knowledge Quiz, the percentages of trainees who demonstrated the various skills outlined on the HMS-BAB Skills Checklist, and the tabulated responses of workshop participants in each of the concept areas and statements explored in the concluding Course Evaluation. This data will be presented in a following section.

### Ethical issues.

Because this project did not involve direct patient contact or contact with patient information, Institutional Review Board (IRB) approval was not deemed necessary. The pre-tests and post-workshop questionnaires were completed by CMs and returned anonymously, and the Skills Checklists completed by this author did not contain individual identifiers. There are no known conflicts of interest related to this project.

## Results

A total of 11 HMS-BAB workshops were conducted for the JFK Maternity Hospital staff during the implementation time frame of this study. This included 36 CMs and 16 RNs employed by the hospital, representing over 74% of the Maternity Hospital staff and 92.3% of the CMs attending deliveries at JFKMC. Several attempts were made by the nurse managers to contact the three remaining CMs and schedule each for a workshop session. One of the CMs was on vacation leave, and the remaining two midwives were ultimately unable to attend due to scheduling and family conflicts. As mentioned previously, the HMS-BAB Program is specifically intended for use with healthcare providers who directly provide childbirth care for

mothers and newborns. While RNs at JFKMC certainly provide care to the intrapartum and postpartum patient, they are not themselves, delivering babies or managing the third stage of childbirth. As such, the following results are that was collected from the CM staff only.

The mean score on the Pre-Program Knowledge Check was 10.67 (SD = 1.53) or 76.2%, with a range of scores from 7 to 13. Appendix D presents the questions of the pre-test, as well as the number and percentage of workshop participants who answered the question correctly. Trainees scored highest on questions 9 (Stem: If the mother's placenta is out and intact, her uterus is soft and does not respond to massage, she has received 2 doses of uterotonic and you can't see any tears, and she continues to bleed excessively the MOST correct thing to do next is) and 14 (Stem: If the placenta has not delivered within 1 hour or the mother is bleeding too much, advanced help should be obtained immediately), and lowest on question 2 (Stem: Which of the following lists contain the three parts of Active Management of the Third Stage of Labor?).

Data for the Skills Checklist (Appendix B) are presented in Tables 1 & 2 below. For routine care, 100% of workshop participants were observed performing two skills: "Deliver baby onto the mother's abdomen" and "dry baby thoroughly and assess for crying" during the simulation practice. The most inconsistent routine skill observed was "cut the umbilical cord between one and three minutes after birth", which was only observed in 58.3% of CMs participating in the workshops. Among the skills necessary when concerns for bleeding arises, CMs most consistently demonstrated "uterine massage should bleeding continue after the delivery of the placenta", as well as "get advanced physician help as needed". Both of these skills were observed in simulation by 94.5% of CMs who participated in the trainings. Conversely, only 50% of CMs were observed "repeating controlled cord traction while stabilizing the uterus to deliver the placenta".

Table 1.

*Skills Checklist for Routine Care*

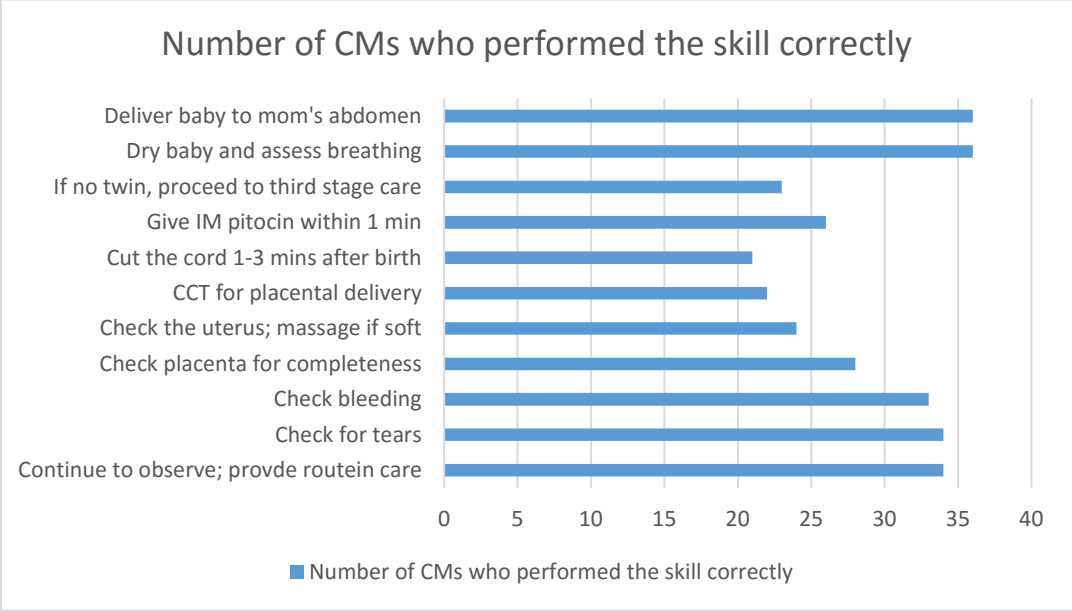
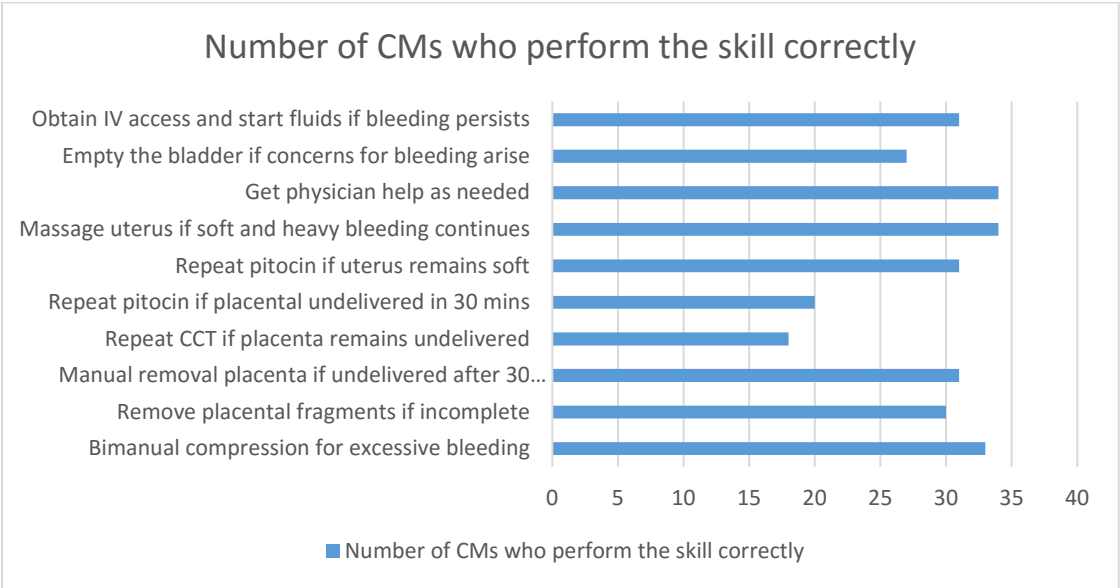



Table 2.

*Skills Checklist When Concerns Arise*



Finally, the means and standard deviations were calculated for each of the assessment statements appearing on the final Course Evaluation, which is detailed in Appendix E. For this Likert-type questionnaire, the highest score (4.94) was associated with the statement “I believe the material presented in the Helping Mothers Survive Bleeding after Birth program is information that every midwife should know”. The lowest score (3.92) was calculated for the statement “There are adequate numbers of nurses and midwives at JFKMC to care for our pregnant patients”.

## Discussion

### Summary and interpretation.

Analysis of the Pre-Program Knowledge Check indicates that CMs score high and have a good understanding of several components which comprise appropriate third stage of labor management. Scores indicate that CMs generally have sound, basic knowledge of the physiologic conditions that can cause a postpartum patient to bleed and put her at risk for PPH. CMs also scored high on the questions checking knowledge for utertonic medication use and vaginal/perineal laceration management following childbirth. Scores on the Knowledge Check also suggest JFKMC CMs are appropriately involving physician support when the clinical picture necessitates a higher level of care for postpartum patients who are bleeding. These results likely reinforce the supportive elements inherent in the Maternity Hospital previously identified by this author: the general availability of both physician support and uterotonic medications for PPH prevention following delivery.

While JFKMC CMs scored well on identifying the physiologic conditions that put a woman at increased risk for PPH, scores on the Pre-Program Knowledge Check suggest that

some of the advanced understanding and critical thinking necessary to apply that knowledge may be lacking. This is evidenced by low mean scores for questions 10 and 13 which reflect a more nuanced application of basic anatomy and pathophysiologic processes. A second area where CMs did not score well on the Pre-Program Knowledge Check was in the identification of the three components of AMTSL themselves. Only 11.1% of workshop participants were able to correctly answer this question. The reason for this are difficult to estimate, but may be related to inconsistent institutional practices around the AMTSL method, general knowledge deficit as a result of past education, or general confusion about the techniques that define the current definition of AMTSL, as the practice as undergone some revisions since first being recommended as the standard practice in childbirth in the early 2000's. The results of the Knowledge Check suggest the HMS-BAB Program had the potential to make a significant positive impact on CM practice at JFKMC.

Similarly, analysis of the Skills Checklist supports the above findings. Here, CMs performed very well on skills related to bleeding assessment, laceration evaluation and repair, and emergency interventions such as intravenous access and fluid replacement, securing physician assistance and involvement, and performing bimanual compression. Analysis of the Checklist indicates inconsistent performance of two of the three components of AMTSL: 1) Controlled cord traction for delivery of the placenta and 2) Uterine fundal check and massage as needed after expulsion of the placenta. Unfortunately there was no simulation directly prior to the HMS-BAB Program with the workshop participants to ascertain if the simulation practices that were observed after the didactic material reflects a positive change in AMTSL practice, or were simply consistent with how the CMs were managing labor prior to this training experience. Of note, a concept presented in the HMS-BAB curriculum that was new to the JFKMC CMs was

delayed cord clamping for one to three minutes after childbirth. Historically, the umbilical cord is clamped within the first minute following expulsion of the newborn and anecdotally, much workshop discussion time was spent specifically considering this practice and its rationale.

Analysis of the simulation Skills Checklist identified that JFKMC CMs are quite consistent in assessing for bleeding, evaluating and repairing lacerations as needed, involving physician care as needed, and performing bimanual compression for uncontrolled PPH. Interestingly, the two skill performance areas that were observed most frequently involved delivering the newborn to the stomach, drying the baby, and assessing for crying/respirations. This degree of practice consistency was not observed by this author on her first trip to JFKMC in September, 2013. These two steps are, however, basic components of the previously-implemented HBB curriculum. Whether the consistency of observed skills in the HMS-BAB training was the result of a change in clinical practice because of the prior HBB education, or because of the material review and reminder in the current AMTSL material is impossible to conclude.

Analysis of the participant responses on the Course Evaluation questionnaire indicate that CMs practicing at JFKMC had both a favorable attitude and belief towards AMTSL practice and PPH management as presented in the HMS-BAB program, and shared in the belief that they as individuals, are capable of providing such care to patients. Results of this questionnaire suggest CMs intended to adapt their practice to reflect an AMTSL approach, and felt their colleagues would readily adopt these practice recommendations as well. Scores for the questions addressing institutional support were considerably lower however, and survey responses suggest CMs did not feel the current staffing numbers were sufficient to adequately care for patients at the

Maternity Hospital, nor did they generally feel JFKMC OB/GYN physicians were sufficiently available for help should a patient care emergency arise.

HMS-BAB workshop participants did evaluate the program positively, however, as reflected by overwhelmingly high scores on questions addressing program organization and overall assessment. This was reflected in the written comments provided by participants at the end of the training as well. Of note, the lowest score in this particular section is related to trainees feeling they had an adequate amount of time to practice the HMS-BAB material in the simulation sessions. This piece in particular, should be considered during any future implementation of the HMS-BAB curriculum. The program specifically suggests a full day of training for this course, and as stated previously, the workshops were shortened to a four-hour, half-day session in order to encourage staff participation and meet the concurrent patient care needs of the Maternity Hospital. While this is quite understandable, feedback from trainees suggested longer workshops may better facilitate knowledge acquisition and skill performance. This may, in turn, lead to a more sustained and robust change in clinical practice.

**Limitations.**

The results of this study could have been significantly strengthened by assessing both pre- and post- knowledge and skills through both written evaluation and simulation observation. Given how this project was implemented, no change in content understanding or clinical ability can be statistically demonstrated. This was due in part to time constraints during the implementation phase of the project, but is primarily the related to an oversight in program design. If such a project were to be implemented again, this is an obvious opportunity for improvement.

A second limitation of this study involves the lack of opportunity to assess long term knowledge retention and practice change. Coordinating a follow-up experience to assess this was simply not possible given the author's time, educational, and financial constraints. While not a limitation to the project design per se, the most significant barrier to sustained practice change would be the failure of the Nursing Educational Department at the Maternity Hospital to continue with the post-training drills as suggested by the HMS-BAB material. One of the hallmark features of the JHPIEGO curriculum, in both the HBB and the HMS-BAB Programs, is the concept of low-dose, high-frequency simulation drills in the subsequent weeks and months following the initial workshop to reinforce new knowledge and skills. Research suggests that this component ensures change in practice (Nelissen et. al, 2015). The HMS-BAB material clearly prescribes the subsequent practice sessions in its literature. The program material, along with the Mama Natalie birth simulator, was left with the Maternity Hospital administrator and Clinical Nurse educator specifically for future use at JFKMC and with midwifery students at the TNIMA. Both individuals were oriented to the written material and the simulator. This author made specific recommendations to continue the JHPIEGO curriculum and ensure that both new staff are trained in the content, and that follow-up simulations are implemented for current CMs and RNs, to ensure long-term practice change for PPH prevention and management. At the time of this project implementation, the follow-up drills for the previously-implemented HBB curriculum were not occurring at the Maternity Hospital, and this author is unclear if new staff are being trained on this material. In order to realize a sustained AMTSL practice and impact PPH rates and sequelae, this ongoing educational reinforcement needs to occur.

## Conclusion

This project involved an implementation effort to bring the HMS-BAB Program to the JFKMC Maternity Hospital in Monrovia Liberia in order to educate staff around the evidence-based, lifesaving AMTSL technique. Eleven workshops were conducted with over 92% of hospital midwives in attendance. While midwife knowledge and skill demonstration suggests Maternity Hospital CMs provide consistent, recommended care for patients if bleeding is heavy after childbirth or if PPH is identified, this project identified a significant knowledge gap in AMTSL knowledge and performance. While an oversight in the project's design prevented adequate data for pre- and post-intervention comparison, the assessment of the course by participants indicates buy-in on the part of CMs for the importance of AMTSL adoption, as well as the intent to make a change in their own clinical practice. CMs indicated an overall self-confidence and belief that they could make a practice change after participating in the HMS-BAB workshop, and expressed the belief that their colleagues can and should make a change in practice as well. A clinical practice guideline was then created and approved by both nursing and physician staff as a means to further promote AMTSL practice as well as a responsive, accurate response to excessive bleeding should a PPH occur. Consistent and wide-spread practice and dissemination of the HMS-BAB content and practice recommendations could make a significant impact in the lives of women who deliver at JFKMC.

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# Appendix A

## Pre-Program Knowledge Check

*adapted from HMS-BAB Provider guide available at http://reprolineplus.org/system/files/resources/HMS_Provider_Guide_English_LR%20interactive_2015.pdf

Select the best answer to each question or statement. Circle the letter of the correct answer:

**1. Which of the following lists contain the three MAIN causes of bleeding after birth?**

a. Soft uterus, a retained placenta, and perineal tearing

b. Soft uterus, malaria, and dehydration

c. Retained placenta, malaria, and perineal tearing

d. Soft uterus, twins, and perineal tearing

**2. Which of the following lists contain the three parts of Active Management of the Third Stage of Labor?**

a. Give uterotonic, manually remove the placenta, and check for tears

b. Cut the cord, wait for the placenta to deliver, and give uterotonic

c. Give uterotonic, provide controlled cord traction, and check tone of the uterus

d. Wait for the placenta to deliver, check for tears, and check the tone of the uterus

3**. According to the World Health Organization, a uterotonic medication should be given to the mother:**

a. Immediately before delivery of the baby

b. Within 1 minute of delivery of the baby

c. Within 5 minutes of delivery of the baby

d. Within 1 hour of delivery of the baby

**4. Which medication does not have any temperature requirements for storage?**

a. Misoprostol

b. Oxytocin

c. Ergometrine

**5. Which of the following uterotonic medication dose is CORRECT for Active Management of Third Stage of Labor?**

a. Misoprostol – 800 mcg

b. Misoprostol – 1200mcg

c. Oxytocin – 10 units

d. Oxytocin – 40 units

**6. How often should a patient's bleeding and uterine tone be checked after delivery of the placenta?**

a. Every 10 minutes for the first 6 hours after delivery

b. Every 15 minutes for the first 2 hours after delivery

c. Once an hour for the first 24 hours

d. Once a day for the first week after delivery

**7. If a mother is bleeding, but her uterus is hard and her placenta is out and complete, which of the following actions is MOST correct?**

a. Check for tears

b. Give a second round of uterotonic

c. Fill the mother's vagina with gauze

d. Ask the mother if she has HIV

**8. If you have not been trained to suture, and if the mother is bleeding from tears that you can see, which of the following actions is MOST correct?**

a. Fill the mother's vagina with clean gauze

b. Use clean technique to apply steady pressure with clean gauze

c. Massage her uterus to stop the bleeding

**9. If the mother's placenta is out and intact, her uterus is soft and does not respond to massage, she has received 2 doses of uterotonic and you can't see any tears, and she continues to bleed excessively the MOST correct thing to do next is:**

a. Have her squat and bear down

b. Give her antibiotics

c. Offer her something to eat

d. Provide bi-manual compression

**10. If the uterus is hard, the mother will never have a postpartum hemorrhage.**

a. True

b. False

**11. What kind of postpartum care is MOST CORRECT for a mother who has received bimanual compression for excessive bleeding?**

a. The same kind of care as any other mother. If the bleeding has stopped she is fine.

b. Advanced care because she has lost a lot of blood and may bleed again

c. Home care as soon as possible after delivery so that she can rest

d. Advanced care so that her uterus can be remove

**12. If the mother's placenta is out and intact, her uterus is hard, and you can't see any tears, but she continues to bleed excessively, you must get an advanced care provider to assist with caring for the mother.**

a. True

b. False

**13. A slow flow of blood from the vagina after delivery that does not stop can be a sign of a postpartum hemorrhage.**

a. True

b. False

**14. If the placenta has not delivered within 1 hour or the mother is bleeding too much, advanced help should be obtained immediately.**

a. True

b. False

## Appendix B

### Skills Checklist

*adapted from HMS-BAB Provider guide available at http://reprolineplus.org/system/files/resources/HMS_Provider_Guide_English_LR%20interactive_2015.pdf

### Routine Care for Mother and Baby

_____ Deliver baby onto mother's stomach

_____ Dry baby thoroughly and assess for crying; cover with a dry cloth

_____ Check for second baby; if none, proceed with third stage care while continuing to observe baby

_____ Give 10 units of oxytocin to the mother within one minute after delivery

_____ Cut the cord between one and three minutes after birth

_____ Perform immediate controlled cord traction during contractions while stabilizing the uterus

_____ Feel the uterus once the placenta delivers and massage if soft

_____ Check placenta for completeness

_____ Check the amount of bleeding and assess if it is normal

_____ Check for tears and repair as appropriate

_____ Continue to closely observe mother and baby and provide routine care, checking the uterus every 15 minutes for at least 2 hours after delivery

### Interventions When Concerns Arise

For any concerns that arise related to postpartum bleeding

_____ Obtain IV access and start fluids

_____ Empty the patient's bladder

_____ Get advanced physician help as needed

Once the placenta is delivered, if the uterus remains soft and heavy bleeding continues

_____ Massage the uterus until firm and bleeding slows

_____ Repeat 10 units of oxytocin or 200mcg of misoprostol

If the placenta is undelivered at 30 minutes after attempts at AMTSL

_____ Repeat 10 units of oxytocin

_____ Repeat controlled cord traction while stabilizing the uterus to deliver the placenta

_____ If the placenta remains undelivered, perform manual removal

If he placenta is delivered but appears incomplete

_____ Perform manual removal of the retained fragments

If the uterus remains soft and bleeding is excessive despite massage and medications

_____ Perform bimanual uterine compression

## Appendix C

### Course Evaluation

Please place an X through the box that best describes your answer. There are **25 questions.**

1) I believe that Active Management of the Third Stage of Labor (AMTSL) is an important intervention to prevent bleeding after birth

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

2) I intend to practice AMTSL at every delivery I attend

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

3) I feel confident in my ability to identify the risk factors for Postpartum Hemorrhage

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

4) I feel confident in my ability to perform the three steps of AMTSL

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

5) I feel confident in my ability to care from women after delivery with normal postpartum bleeding

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

6) I feel confident in my ability to care for a woman with a soft uterus

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

7) I feel confident in my ability to care for a woman with an undelivered or incomplete placenta

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

8) I feel confident in my ability to care for a woman with vaginal tearing

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

9) I feel confident in my ability to provide uterine compression for women with excessive bleeding

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

10) I feel confident in my ability to seek advanced care from a physician

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

11) I believe the material presented in the Helping Mothers Survive Bleeding After Birth program is information that every midwife should know

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

12) I believe that my midwife colleagues can perform the skills presented in this training

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

13) I believe my midwifery colleagues should practice AMTSL at every delivery they attend

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

14) I have the supplies I need to care for women after childbirth should heavy bleeding develop

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

15) Physicians are always available to help me should an emergency

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

16) There are adequate numbers of nurses and midwives at JFKMC to care for our pregnant patients

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

17) I had enough time to learn how to help mothers survive bleeding after birth

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

18) I could ask questions

| 1<br>Strongly Disagree | 2<br>Disagree | 3<br>Neither agree Nor Disagree | 4<br>Agree | 5<br>Strongly Agree |
|---|---|---|---|---|

19) The facilitator listened to my questions

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

20) The facilitator answered my questions

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

21) I had enough time to practice Helping Mothers Survive Bleeding after Birth

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

22) The course prepared me to answer the knowledge check questions

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

23) The course prepared me to perform Active Management of the Third Stage of Labor

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

24) The course prepared me to manage heavy bleeding after delivery

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

25) The course prepared me to make decisions and actions in a case scenario

| | | | | |
|---|---|---|---|---|
| **1 Strongly Disagree** | **2 Disagree** | **3 Neither agree Nor Disagree** | **4 Agree** | **5 Strongly Agree** |

What was the best thing about this course?

What would make the course better?

Other comments:

## Appendix D

### Individual Question Analysis of the Pre-Knowledge Check

| Question stem | Number of trainees who answered correctly (%) |
|---|---|
| 1) Which of the following lists contain the three MAIN causes of bleeding after birth? | 33 (91.7%) |
| 2. Which of the following lists contain the three parts of Active Management of the Third Stage of Labor? | 4 (11.1%) |
| 3. According to the World Health Organization, a uterotonic medication should be given to the mother: | 26 (77.8%) |
| 4. Which medication does not have any temperature requirements for storage? | 29 (80.6%) |
| 5. Which of the following uterotonic medication dose is CORRECT for Active Management of Third Stage of Labor? | 32 (88.9%) |
| 6. How often should a patient's bleeding and uterine tone be checked after delivery of the placenta? | 22 (61.1%) |
| 7. If a mother is bleeding, but her uterus is hard and her placenta is out and complete, which of the following actions is MOST correct? | 33 (91.7%) |
| 8. If you have not been trained to suture, and if the mother is bleeding from tears that you can see, which of the following actions is MOST correct? | 30 (83.3%) |
| 9. If the mother's placenta is out and intact, her uterus is soft and does not respond to massage, she has received 2 doses of uterotonic and you can't see any tears, and she continues to bleed excessively the MOST correct thing to do next is: | 35 (97.2%) |
| 10. If the uterus is hard, the mother will never have a postpartum hemorrhage. | 22 (61.1%) |
| 11. What kind of postpartum care is MOST CORRECT for a mother who has received bimanual compression for excessive bleeding? | 28 (77.8%) |

| | |
|---|---|
| 12. If the mother's placenta is out and intact, her uterus is hard, and you can't see any tears, but she continues to bleed excessively, you must get an advanced care provider to assist with caring for the mother. | 31 (86.1%) |
| 13. A slow flow of blood from the vagina after delivery that does not stop can be a sign of a postpartum hemorrhage. | 24 (66.7%) |
| 14. If the placenta has not delivered within 1 hour or the mother is bleeding too much, advanced help should be obtained immediately. | 35 (97.2%) |

## Appendix E

### Individual Statement Analysis of the Course Evaluation Questionnaire

| Questionnaire Statement | Mean (Standard Deviation) |
|---|---|
| *Attitudes and Beliefs* | |
| 1) I believe that Active Management of the Third Stage of Labor (AMTSL) is an important intervention to prevent bleeding after birth. | 4.89 (0.32) |
| 2) I intend to practice AMTSL at every delivery I attend. | 4.69 (0.47) |
| *Self-Efficacy* | |
| 3) I feel confident in my ability to identify the risk factors for Postpartum Hemorrhage. | 4.67 (0.48) |
| 4) I feel confident in my ability to perform the three steps of AMTSL. | 4.72 (0.45) |
| 5) I feel confident in my ability to care from women after delivery with normal postpartum bleeding. | 4.39 (0.49) |
| 6) I feel confident in my ability to care for a woman with a soft uterus. | 4.39 (0.77) |
| 7) I feel confident in my ability to care for a woman with an undelivered or incomplete placenta. | 4.39 (1.08) |
| 8) I feel confident in my ability to care for a woman with vaginal tearing. | 4.33 (0.79) |
| 9) I feel confident in my ability to provide uterine compression for women with excessive bleeding. | 4.56 (0.50) |
| 10) I feel confident in my ability to seek advanced care from a physician. | 4.25 (0.98) |
| *Social Norms* | |

| | |
|---|---|
| 11) I believe the material presented in the Helping Mothers Survive Bleeding After Birth program is information that every midwife should know. | 4.94 (0.23) |
| 12) I believe that my midwife colleagues can perform the skills presented in this training. | 4.50 (0.51) |
| 13) I believe my midwifery colleagues should practice AMTSL at every delivery they attend. | 4.44 (0.65) |
| *Institutional Support* | |
| 14) I have the supplies I need to care for women after childbirth should heavy bleeding develop. | 4.06 (0.98) |
| 15) Physicians are always available to help me should an emergency. | 3.97 (0.88) |
| 16) There are adequate numbers of nurses and midwives at JFKMC to care for our pregnant patients. | 3.92 (1.23) |
| *Organization of the Course* | |
| 17) I had enough time to learn how to help mothers survive bleeding after birth. | 4.39 (0.55) |
| 18) I could ask questions. | 4.44 (0.50) |
| 19) The facilitator listened to my questions. | 4.47 (0.51) |
| 20) The facilitator answered my questions. | 4.58 (0.50) |
| 21) I had enough time to practice Helping Mothers Survive Bleeding after Birth. | 4.39 (0.77) |
| *Overall Program Assessment* | |
| 22) The course prepared me to answer the knowledge check questions. | 4.47 (0.51) |
| 23) The course prepared me to perform Active Management of the Third Stage of Labor. | 4.69 (0.47) |
| 24) The course prepared me to manage heavy bleeding after delivery. | 4.80 (0.45) |

| | |
|---|---|
| 25) The course prepared me to make decisions and actions in a case scenario. | 4.44<br>(0.50) |